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WT 11-19

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**FEB - 3 2011**

Federal Communications Commission  
Office of the Secretary

June 2, 2010

**BY CERTIFIED MAIL**

Federal Communications Commission  
P.O. Box 979097  
St. Louis, MO 63197-9000

**Re: EMS Technologies Canada, Ltd. Request for Waiver of Part 87 Rule**

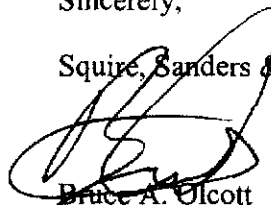
Dear Sir or Madam:

On behalf of EMS Technologies Canada, Ltd., enclosed for filing please find a request for waiver of one (1) section of Part 87 of the Commission's rules, along with an FCC Form 159 and a check payable to "FCC" in the amount of \$175.00.

Please date-stamp the extra copy and return it using the self-addressed, stamped envelope provided. Please feel free to contact us with any questions.

Sincerely,

Squire, Sanders & Dempsey L.L.P.



Bruce A. Olcott  
Joshua T. Guyan

SQUIRE  
SANDERS

LEGAL  
COUNSEL  
WORLDWIDE

SPECIAL ACCOUNT  
WASHINGTON, DC 20004

PNC Bank, N.A. 040  
Virginia

15-3  
540

Check Number 022661

Date June 2, 2010

Amount \*\*\*\*\* \$175.00

PAY: One Hundred Seventy-Five Dollars and 00 Cents \*\*\*\*\*

To the  
order of: FCC

*Tammy A. Kuntz*  
VOID 6 MONTHS AFTER DATE OF ISSUE

THE BACK OF THIS DOCUMENT CONTAINS THE SQUIRE SANDERS LOGO PRINTED IN WHITE INK IN MULTIPLE POSITIONS - HOLD AT AN ANGLE TO VIEW - VOID IF NOT PRESENT

⑈022661⑈ ⑆054000030⑆ 5300728311⑈

READ INSTRUCTIONS CAREFULLY  
BEFORE PROCEEDING

FEDERAL COMMUNICATIONS COMMISSION  
**REMITTANCE ADVICE**  
FORM 159

Approved by OMB  
3046-0589  
Page No. 1 of 2

(1) LOCKBOX # <b>979097</b>			
<b>SECTION A - PAYER INFORMATION</b>			
(2) PAYER NAME (if paying by credit card enter name exactly as it appears on the card) <b>Joshua T. Guvan</b>		(3) TOTAL AMOUNT PAID (U.S. Dollars and cents) <b>\$175.00</b>	
(4) STREET ADDRESS LINE NO. 1 <b>1201 Pennsylvania Avenue, N.W.</b>			
(5) STREET ADDRESS LINE NO. 2 <b>Suite 500</b>			
(6) CITY <b>Washington</b>		(7) STATE <b>DC</b>	(8) ZIP CODE <b>20004</b>
(9) DAYTIME TELEPHONE NUMBER (include area code) <b>(202) 626-6245</b>		(10) COUNTRY CODE (if not in U.S.A.)	
<b>FCC REGISTRATION NUMBER (FRN) REQUIRED</b>			
(11) PAYER (FRN) <b>0016829574</b>			
IF MORE THAN ONE APPLICANT, USE CONTINUATION SHEETS (FORM 159-C) COMPLETE SECTION BELOW FOR EACH SERVICE. IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEET			
(13) APPLICANT NAME <b>EMS Technologies Canada, Ltd.</b>			
(14) STREET ADDRESS LINE NO. 1 <b>400 Maple Grove Rd.</b>			
(15) STREET ADDRESS LINE NO. 2			
(16) CITY <b>Ottawa</b>		(17) STATE <b>Ontario</b>	(18) ZIP CODE <b>K2V 1B8</b>
(19) DAYTIME TELEPHONE NUMBER (include area code) <b>(613) 591-6040</b>		(20) COUNTRY CODE (if not in U.S.A.) <b>Canada</b>	
<b>FCC REGISTRATION NUMBER (FRN) REQUIRED</b>			
(21) APPLICANT (FRN) <b>0019381896</b>			
COMPLETE SECTION C FOR EACH SERVICE, IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEET			
(23A) CALL SIGN/OTHER ID	(24A) PAYMENT TYPE CODE <b>PDWM</b>	(25A) QUANTITY	
(26A) FEE DUE FOR (PTC) <b>\$175.00</b>	(27A) TOTAL FEE <b>\$175.00</b>		
(28A) FCC CODE 1	(29A) FCC CODE 2		
(23B) CALL SIGN/OTHER ID	(24B) PAYMENT TYPE CODE	(25B) QUANTITY	
(26B) FEE DUE FOR (PTC)	(27B) TOTAL FEE		
(28B) FCC CODE 1	(29B) FCC CODE 2		
<b>SECTION D - CERTIFICATION</b>			
<b>CERTIFICATION STATEMENT</b> I, _____, certify under penalty of perjury that the foregoing and supporting information is true and correct to the best of my knowledge, information and belief.			
SIGNATURE _____		DATE _____	
<b>SECTION E - CREDIT CARD PAYMENT INFORMATION</b>			
MASTERCARD _____ VISA _____ AMEX _____ DISCOVER _____			
ACCOUNT NUMBER _____		EXPIRATION DATE _____	
I hereby authorize the FCC to charge my credit card for the service(s) authorization herein described.			
SIGNATURE _____		DATE _____	

June 2, 2010

**BY CERTIFIED MAIL**

James Shaffer  
Mobility Division  
Wireless Telecommunications Bureau  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

**Re: EMS Technologies Canada, Ltd. Request for Waiver of Section 87.139(i)(1) to Allow  
Equipment Certification of Aeronautical Mobile Satellite Service Transceiver HSD-  
MK2**

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Dear Mr. Shaffer:

On April 29, 2010, the Wireless Telecommunications Bureau ("Bureau") granted EMS Technologies Canada, Ltd. ("EMS") a waiver of Sections 87.131, 87.133, 87.137, 87.139(i)(1), 87.139(i)(3) and 87.141(j) of the Commission's rules to permit certification of its next generation aeronautical-mobile satellite service ("AMSS") transceivers A781, HSD-MK2, A781-MK2, HSD-MK3, and A781-MK3.<sup>1</sup> As discussed below, EMS, by its attorneys and pursuant to section 1.925 of the Commission's rules, hereby requests one additional waiver of the Commission's rules. Specifically, EMS seeks a waiver of the required attenuation levels in Section 87.139(i)(1) of the Commission's rules to permit certification of the HSD-MK2.

The HSD-MK2 transceiver is intended for use on aircraft to provide high-speed Internet, voice and video conferencing capabilities in the cockpit, in the cabin and at the gate. The transceiver would be introduced as a new EMS product in the United States once FCC certification has been secured and will support the Inmarsat Classic, Swift64 and SwiftBroadband aircraft communications services. EMS's transceiver would provide high-speed voice and data links to Inmarsat's world-wide satellite network in the 1525-1559 MHz receive and 1626.5-1660.5 MHz transmit bands. The HSD-MK2 is a derivative of

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<sup>1</sup> See EMS Technologies Request for Waiver filed on April 9, 2010 and granted by the Bureau on April 29, 2010, included as an Exhibit ("EMS Waiver Grant").

the authorized HSD-440.<sup>2</sup> It employs a different channel card to provide additional Inmarsat Classic channels.

The HSD-MK2 complies with Inmarsat technical requirements and specifications. A letter in support from Inmarsat can be provided at your request. In addition, the EMS transceiver meets the applicable ARINC Characteristics 429, 739, 600, 741 and 781; RTCA/DO-210 "The Satcom Minimum Operational Performance Standards;" and will be certified pursuant to a Federal Aviation Administration Type Certification, Supplemental Type Certification, and/or Technical Standard Order Certification as applicable to the end customer requirements. Therefore, grant of the instant waiver is in the public interest.

#### **Requested Waiver – 87.139(i)(1)**

As EMS explained in its previous waiver request for this device, the HSK-MK2 will meet the technical requirements of the Part 87 AMSS rules with respect to output power, spurious emissions, intermodulation and priority and preemption. Specifically, Swift64 and SwiftBroadband transmissions can be suspended if they would interfere with safety-related messages, or if ordered by the captain of the aircraft.<sup>3</sup> The Part 87 rules, however, only contemplate the modulation types and transmission characteristics used for the Inmarsat Aero-H, Aero-L and Aero-I services. Inmarsat's Swift64 and SwiftBroadband services offer higher data rates by utilizing more efficient modulation techniques. The Part 87 rules have not yet been updated to reflect these emissions types and bandwidth.

Section 87.139(i)(1) of the Commission's rules provides the required attenuation for a modulated carrier relative to the maximum emission envelope level. This mask is intended for use in conjunction with the authorized bandwidth in Section 87.137(a) of the Commission's rules for aircraft earth stations. The Bureau, however, granted EMS a waiver of Section 87.137(a) of the rules to operate the HSD-MK2 at a larger authorized bandwidth due to the increased symbol rates for 16-QAM.<sup>4</sup>

The larger authorized bandwidth requires a 9.5 dB adjustment to the emission mask set forth in Section 87.139(i)(1). At the larger bandwidth the total power is more widely distributed and the emission envelope is at a lower absolute level for an equivalent total carrier power. Therefore, EMS's request for a waiver to permit a 9.5 dB adjustment in the mask reflects the mask that would be extrapolated if the attenuation levels specified in Section 87.139(i)(1) were associated with the larger bandwidth that the Commission authorized EMS to use in its April 29, 2010 waiver grant. As a result, an adjustment of 9.5 dB in the emissions mask specified in Section 87.139(i)(1) would provide the same effective protection levels as specified currently in the Commission's rules.

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<sup>2</sup> See EMS equipment authorization for the HSD-440 transceiver, FCC ID K6KHSD-440 (2010).

<sup>3</sup> See 47 C.F.R. §87.189(e).

<sup>4</sup> See EMS Waiver Grant.

The 9.5 dB adjustment is derived as follows:

$$\begin{aligned}\text{Adjustment (dB)} &= 10 * \log_{10} [ (\text{larger authorized BW}) / (\text{Part 87 authorized BW}) ] \\ &= 10 * \log_{10} [ (225 \text{ kHz}^5) / (25 \text{ kHz}^6) ] \\ &= 9.5 \text{ dB}\end{aligned}$$

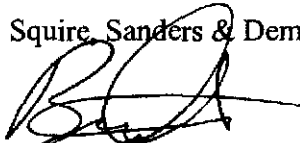
### Conclusion

EMS requests that the Commission waive the attenuation requirements of Section 87.139(i)(1) described above to permit certification of its Inmarsat AMSS transceiver, the HSD-MK2. This waiver is necessary to make the HSD-MK2's authorized larger bandwidth consistent with the corresponding attenuation levels. Such waiver will provide the same protection levels as the existing mask. It will therefore not cause harmful interference to other services and is in the public interest.

Please feel free to contact the undersigned with any questions.

Respectfully submitted,

Squire, Sanders & Dempsey L.L.P.



Bruce A. Olcott  
Joshua T. Guyan

Exhibit

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<sup>5</sup> See *id.*

<sup>6</sup> See 47 C.F.R. §87.137(a).

# **EXHIBIT**



SQUIRE, SANDERS & DEMPSEY L.L.P.

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1201 Pennsylvania Avenue, N.W.  
Washington, DC 20004

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Direct Dial: +1.202.626.6615  
bolcott@ssd.com

April 9, 2010

**BY CERTIFIED MAIL**

James Shaffer  
Mobility Division  
Wireless Telecommunications Bureau  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

**GRANTED**

FOR THE REASONS INDICATED BELOW

APRIL 29, 2010

**Re: EMS Technologies Canada, Ltd. Request for Waiver of Part 87 Rules to Allow Equipment Certification of Aeronautical Mobile Satellite Service Transceivers**

Dear Mr. Shaffer:

EMS Technologies Canada, Ltd. ("EMS"), by its attorneys, pursuant to section 1.925 of the Commission's rules, hereby requests waiver of Sections 87.131, 87.133, 87.137, 87.139(i)(1), 87.139(i)(3) and 87.141(j) of the Commission's rules to permit certification of its next generation aeronautical-mobile satellite service ("AMSS") transceivers A781, HSD-MK2, A781-MK2, HSD-MK3, and A781-MK3. These transceivers will be introduced as new EMS products in the United States once FCC certification has been secured and will support the Inmarsat Classic, Swift64 and SwiftBroadband aircraft communications services.

Similar waivers of the Part 87 rules have been granted to EMS, Honeywell International, Inc., and Rockwell Collins, Inc. to permit certification of similar equipment.<sup>1</sup> Such equipment is intended for use on aircraft to provide high-speed Internet, voice and video conferencing capabilities in the cockpit, in the cabin and at the gate. The EMS transceivers comply with Inmarsat technical requirements and specifications. A letter in support from Inmarsat can be provided at your request. In addition, the EMS transceivers meet the applicable ARINC Characteristics 429, 739, 600, 741 and 781; RTCA/DO-210 "The

<sup>1</sup> See EMS equipment authorization for the HSD-440 transceiver, FCC ID K6KHSD-440 (2010), Honeywell International, Inc. equipment authorization for the HD-128 transceiver, FCC ID GB8HD-128 (2007), and Rockwell Collins, Inc. equipment authorization for the HST-2110B and HST-2120B transceivers, FCC ID AJK8222232 and AJK8222234 (2008).

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Satcom Minimum Operational Performance Standards;" and will be certified pursuant to a Federal Aviation Administration Type Certification, Supplemental Type Certification, and/or Technical Standard Order Certification as applicable to the end customer requirements. Therefore, grant of the instant waiver is in the public interest.

#### **EMS Transceivers Background**

EMS's transceivers would provide high-speed voice and data links to Inmarsat's world-wide satellite network in the 1525-1559 MHz receive and 1626.5-1660.5 MHz transmit bands. The next generation transceivers A781, HSD-MK2, A781-MK2, HSD-MK3, and A781-MK3 support the Inmarsat Classic AMS(R)S, Swift64, and SwiftBroadband services. The A781 is a derivative of the authorized HSD-440 (FCC ID K6KHSD-440). It uses the same transceiver channel cards, a different output power amplifier, and is packaged in a six Modular Concept Unit ("MCU") equipment box versus an eight MCU used for the HSD-440. It is also capable of operation with its internal amplifier or with a separate external flange mounted power amplifier. The HSD-MK2 is also a derivative of the authorized HSD-440. It employs a different channel card to provide additional Inmarsat Classic channels. The A781-MK2 uses this same channel card as the HSD-MK2 but is based on the A781 package. Finally, the HSD-MK3 and the A781-MK3 transceivers employ a third type of transceiver channel card that supports transmission of different types of Inmarsat services on the same card.

#### **Requested Waivers – Part 87**

The EMS transceivers will meet the technical requirements of Part 87 AMSS rules with respect to output power, spurious emissions, intermodulation and priority and preemption. Specifically, Swift64 and SwiftBroadband transmissions can be suspended if they would interfere with safety-related messages, or if ordered by the captain of the aircraft.<sup>2</sup> The Part 87 rules, however, only contemplate the modulation types and transmission characteristics used for the Inmarsat Aero-H, Aero-L and Aero-I services. Inmarsat's Swift64 and SwiftBroadband services offer higher data rates by utilizing more efficient modulation techniques. The Part 87 rules have not yet been updated to reflect these emissions types and bandwidth.

#### **87.131 Authorized Emissions**

Section 87.131 authorizes G1D, G1E and G1W for aircraft earth stations. The Swift64 and SwiftBroadband services, however, use 16 Point Quadrature Amplitude Modulation ("16-QAM") and QPSK modulation schemes, with emission types G7W and D7W. Therefore, EMS requests waiver of the authorized emissions in Section 87.131 of the Commission's rules.

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<sup>2</sup> See 47 C.F.R. §87.189(e).

87.133 Frequency Stability

Pursuant to Section 87.133(a), the frequency tolerance of an aircraft earth station operating in the 1626.5-1660.5 MHz band is  $\pm 320$  Hz. For purposes of bench testing for certification, a tolerance of  $\pm 160$  Hz applies to the reference oscillator of the transmitter. The EMS transceivers contain a HSR oscillator with a guaranteed accuracy (including aging) equivalent to  $\pm 365$  Hz. Therefore, the guaranteed accuracy of any Classic, Swift64 or SwiftBroadband transmissions will be  $\pm 365$  Hz and EMS requests a waiver of Section 87.133(a) of the Commission's rules for this reason.

87.137 Types of Emissions

Section 87.137(a) of the Commission's rules authorizes for aircraft earth stations emissions designator 21K0G1D and the authorized bandwidth for aircraft earth station emissions above 50 MHz is 25 kHz. Lower values of necessary and authorized bandwidth are also permitted. As explained above, Swift64 and SwiftBroadband utilize a 16-QAM and QPSK modulations, with emissions classes D7W, G7W or G1E. In addition, due to the increased symbol rates for 16-QAM, a larger authorized bandwidth is necessary. An adequate bandwidth for Swift64 is 45 kHz and an adequate bandwidth for SwiftBroadband is 225 kHz.

Therefore, EMS seeks waiver of Section 87.137(a) of the Commission's rules to authorize the following emissions designators and authorized bandwidth for the EMS transceivers:

Emissions Designator	Authorized Bandwidth (kHz) (Above 50 MHz)
21K0G1D	45
7K20G1E	45
40K0G1E	45
40K0G1D	45
25K0G7W	225
50K0G7W	225
100KG7W	225
200KG7W	225
50K0D7W	225
100KD7W	225
200KD7W	225

87.139(i)(1), note 2 Emission Limitations

Section 87.139(i)(1) of the Commission's rules provides the required attenuation for a modulated carrier and note 2 provides an absolute offset of  $\pm 35$  kHz. Under the required designs for the new modulation techniques, in many cases, ninety-nine percent of the occupied bandwidth exceeds the  $\pm 35$  kHz offset. In other words, the new modulation schemes used for Swift64 and SwiftBroadband make

meeting the offset impossible. In accordance with the Inmarsat requirements, EMS requests a waiver of Section 87.139(i), note 2 to permit an absolute offset of +/- 504 kHz.<sup>3</sup>

**87.139(i)(3) Emission Limitations**

The 3 kbps BPSK signaling channel used for Swift64 does not employ the same filtering as used by other modulation types. The BPSK signal will not meet the mask requirement as stated in Section 87.139(i)(3). The mask as defined by Inmarsat is<sup>4</sup>:

Offset from Assigned Carrier Frequency (KHz)	Relative Level (dB) Minimum	Maximum
0 to 1	-1.7	+1
1 to 10	Not specified	+1
10 to 20	Not specified	-16-(9/10)(F-10)
20 to 40	Not specified	-25-(6/20)(F-20)
40 to 80	Not specified	-31-(6/40)(F-40)
80 to 100	Not specified	-37-(23/20)(F-80)

EMS requests waiver of Section 87.139(i)(3) to allow the use of a 3 kbps BPSK emission that meets the Inmarsat mask requirements above. No waiver is necessary for the SwiftBroadband service because Inmarsat's restrictions are tighter than those specified in Section 87.139(i)(3).

**87.141(j) Modulation Requirements**

Section 87.141(j) of the Commission's rules requires transmitters used as aircraft earth stations to employ BPSK for transmission rates up to and including 2400 bps, and QPSK for higher rates. Due to the requirements of the Swift64 and SwiftBroadband services, the EMS transceivers use additional modulation schemes that do not meet this requirement. Specifically, the Swift64 and SwiftBroadband services require the use of 16-QAM at transmission rates higher than 2400 bps and the use of BPSK for the Swift64 3 kbps signaling channel. EMS therefore requests waiver of Section 87.141(j) of the Commission's rules to permit these modulations.

**Conclusion**

EMS requests that the Commission waive the requirements of Part 87 described above to permit certification of its Inmarsat AMSS transceivers. The Commission has granted similar waivers to EMS, Rockwell Collins, Honeywell and others so that aircraft passengers and crew can receive high speed voice and data communications. Such waiver will not cause harmful interference to other services and is in the public interest.

<sup>3</sup> See Inmarsat BGAN SDM Vol. 5, Ch. 3, ¶ 2.4.8.

<sup>4</sup> See Inmarsat Mini-M System Definition Manual, Module 2, Part 1, Section 3.5.8.2 and Figure 11.

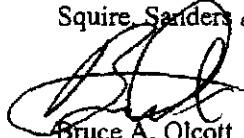
James Shaffer  
April 9, 2010  
Page 5

SQUIRE, SANDERS & DEMPSEY L.L.P.

Please feel free to contact the undersigned with any questions.

Respectfully submitted,

Squire, Sanders & Dempsey L.L.P.

A handwritten signature in black ink, appearing to be "B. Olcott", written over the printed name.

Bruce A. Olcott  
Joshua T. Guyan